

Chen
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REMARKS

Amendments to pending claims

Independent claim 1 has been amended such that “*the lower layer and the upper layer have a substantially identical width after etching*, resulting from the lower layer and the upper layer being initially hard mask etched together as a single hard mask layer prior to hard mask trimming of the lower layer.” Independent claim 1 has also been amended to include “an etching-stop layer between the lower layer and the primary layer.” Similarly, independent claim 17 has been amended such that hard mask etching the lower layer and the upper layer is performed with respect to the lower and upper layers together as a single hard mask layer “*down to an etching-stop layer between the lower layer and the primary layer, such that the lower layer and the upper layer have a substantially identical width after etching*.” Support for these amendments is found at least second in FIGs. 3 and 4B and their conjoining description in the patent application as filed, in which the lower layer and the upper layer are hard mask etched together in 304 of FIG. 3, example performance of which is illustrated in FIG. 4B. The widths of both the lower layer and the upper layer are described as being “substantially equal to that of the photoresist layer,” and hence substantially identical to each other. The oxide layer is further described as an “etch stop, so that etching does not reach the silicon layer,” and hence is an etching-stop layer.

Claim rejections under 35 USC 103

Claims 1-7 and 17-20 have been rejected under 35 USC 103(a) as being unpatentable over Aminpur (6,482,726). Claims 1 and 17 are independent claims, from which the remaining pending claims ultimately depend. Applicant asserts that claims 1 and 17, as have been amended, are not rendered unpatentable over Aminpur. Claims 2 and 18 have been cancelled. Because claims 3-7 and 19-20 ultimately depend from claims 1 and 17, they are patentable for at least the same reasons that claims 1 and 17 are patentable.

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First, claims 1 and 17 are limited to the lower layer and the upper layer having a substantially identical width after etching, whereas Aminpur's lower and upper layers never have a substantially identical width after etching. For instance, in FIG. 6 of Aminpur, the upper layer 650 is etched, but the lower layer 540 is not etched, such that the upper layer 650 does not have a substantially identical width to the width of the lower layer 540. Similarly, in FIG. 7 of Aminpur, the lower layer 740 is etched around the upper layer 650, such that the upper layer 650 does not have a substantially identical width to the width of the lower layer 740. The limitation that the lower layer and the upper layer have a substantially identical width is of course a structural limitation, and not a process limitation, and therefore holds patentable weight, such that claims 1 and 17 are patentable over Aminpur for this reason.

Second, claims 1 and 17 are limited to the presence of an etching stop layer below the lower layer. Aminpur does not disclose the presence of an etching stop layer below its lower layer 540/640/740 of FIGs. 5, 6, and 7. Furthermore, there is no motivation to add an etching stop layer below the lower layer in Aminpur. In the claimed invention, the etching stop layer is needed because, as is claimed, the lower and the upper layers are both hard mask etched together as a single layer, such that the etch stop is needed to prevent etching below the lower layer. However, in Aminpur, as is apparent from FIGs. 6 and 7, the lower layer 540/640 is never etched together with the upper layer 550/650. Indeed, when the upper layer 550/650 is etched alone, as indicated in FIG. 6 of Aminpur, the lower layer 540/640 itself serves as an etch stop for such etching. Because the upper and the lower layers in Aminpur are never etched together, there is no motivation to add an etching stop layer. Adding such an etching stop layer would only serve to add additional cost to the manufacture of the device in Aminpur, the fact of which effectively teaches away from adding an etching stop layer below the lower layer in Aminpur. The limitation of an etching stop layer below the lower layer is also of course a structural limitation, and not a process limitation, and therefore holds patentable weight, such that claims 1 and 17 are patentable over Aminpur, for the reason described in this paragraph as well.

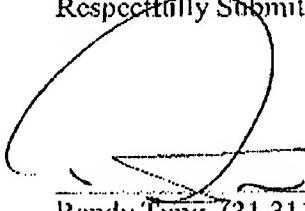
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Conclusion

Applicant has made a diligent effort to place the pending claims in condition for allowance, and request that they so be allowed. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Randy Tung, Applicant's Attorney, at 248-540-4040, so that such issues may be resolved as expeditiously as possible. For these reasons, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,



Randy Tung (31,311)